



PETKUS

PETKUS Storage Systems

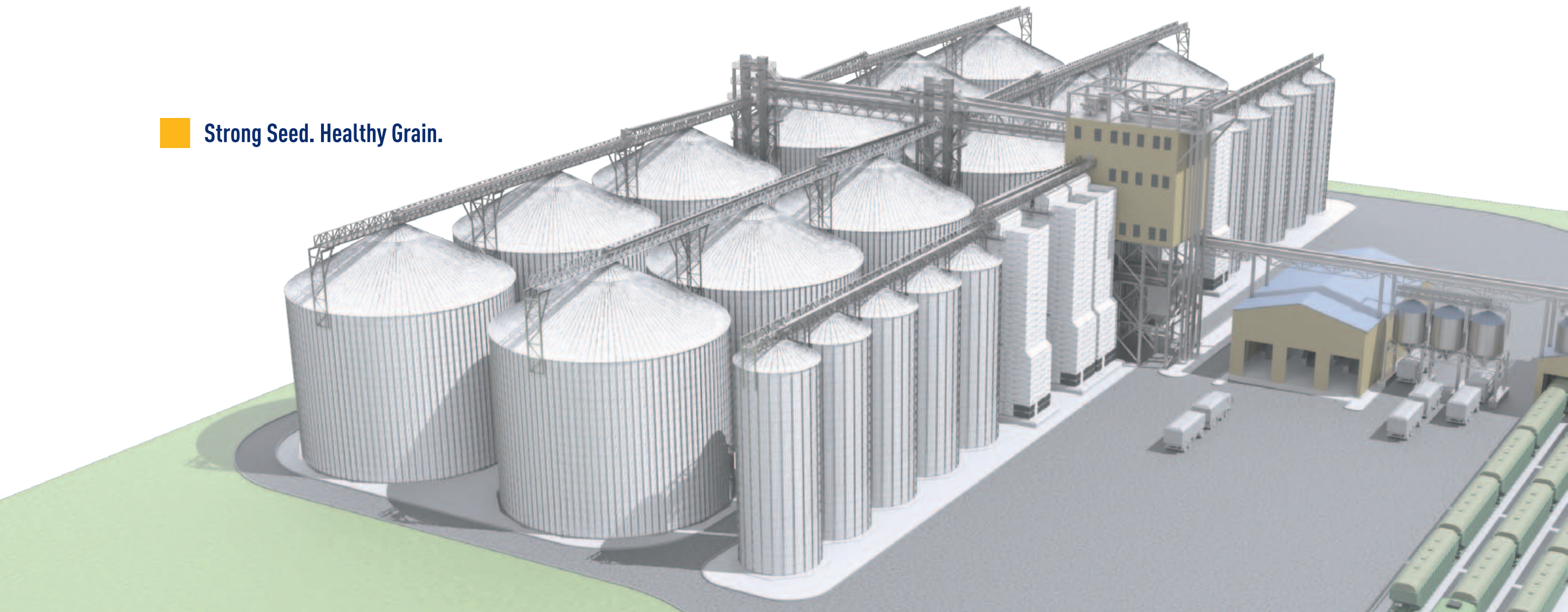


Strong Seed. Healthy Grain.

Strong seed and healthy grain are no luxury, but essential to life.
We supply the necessary technologies. This means ingenious technological solutions and high quality products across the entire process chain - from breeders' basic seed to seed multiplying and production on farm to further processing of food and feed products.

So that strong seed and healthy grain remain valuable!

Strong Seed. Healthy Grain.



PETKUS Storage Systems

Tailor-made solutions

Those who invest in storage technology, want optimized and individual solutions regarding costs, depreciation, scheduling and technical requirements. The experienced engineers and designers at PETKUS know what matters.

Whether you are a grain or cereals dealer, miller, farmer, plant breeder, seed producer or in the food or feed industry - we have your respective needs and special requirements in sight and can design a system accordingly. PETKUS builds turn-key solutions for its customers, including steel construction for the machinery house.

Everything from one hand has many advantages: the combination of cell block and machinery house provides for very stable statics. Costs can be reduced and quality assured. You have the choice between steel or concrete substructures, steel or concrete floors, insulated or non-insulated paneling, smoke and explosion protection (ATEX compliant) and aspiration for the reduction of dust emissions.

Easy-flowing bulk materials are optimally stored in PETKUS profile wall silos, while less flowable products are stored better in our smooth wall silos. Square silo systems are safe and solid and made-to-measure in a

modular design. They are available as a silo battery in series or in a block both allowing for different heights and capacity configurations. Different cell sizes are also possible as is a combined solution from two types of silos.

For longer-term storage and for large quantities PETKUS offers modular round silos in different sizes. Our expert engineers calculate static loads in accordance with the current EUROCODES to ensure that your needs and a high standard are met.

There are good reasons for optimal seed storage: food resources are limited and post-harvest losses are high. Insuring the safety of agricultural products in sufficient quantity and quality is therefore becoming a challenge. Attention to detail is thus even more important in the construction of the silos. Only the best planning and conditions make sure that seed is microorganism-free, adequately dried and ventilated, and able to maintain its nutritional value while being stored.



PETKUS Smooth Wall Silos

Solutions for low flow products

Powder, fine seeds or generally slow-flowing goods require special handling or storage. The same is true for products that must remain absolutely contamination free. Our smooth wall silos are perfect here. Almost perfect emptying of the silo is assured because of its specially designed smooth wall surface as well as rounded corners and countersunk screws, optionally with or without hexagon socket to prevent blind spots.

The maximum capacity of a smooth wall cell – at a height of up to 25 meters and a wall length of up to 4 meters – is 400 m³. Additionally, different cell sizes and arrangements can be implemented. Another important advantage of rectangular silos when compared to the round variations is the increase of storage capacity by 25% in regard to the required area and the possibility to connect the silo block with the machinery house which in turn ensures more stability.

The individual smooth wall elements are manufactured at PETKUS on a fully automatic welding line. This avoids distortion of the walls and provides an excellent fit in the local assembly. The cavities are protected against corrosion by cathodic dip-coating. Optionally, the smooth wall elements can be coated with standard RAL or food-safe colours.

The sandwich or modular construction is a guarantee for security and stability. With this method, the double wall elements are inserted horizontally and vertically screwed. Thus, a hollow pillar is created which is filled with concrete after assembly.

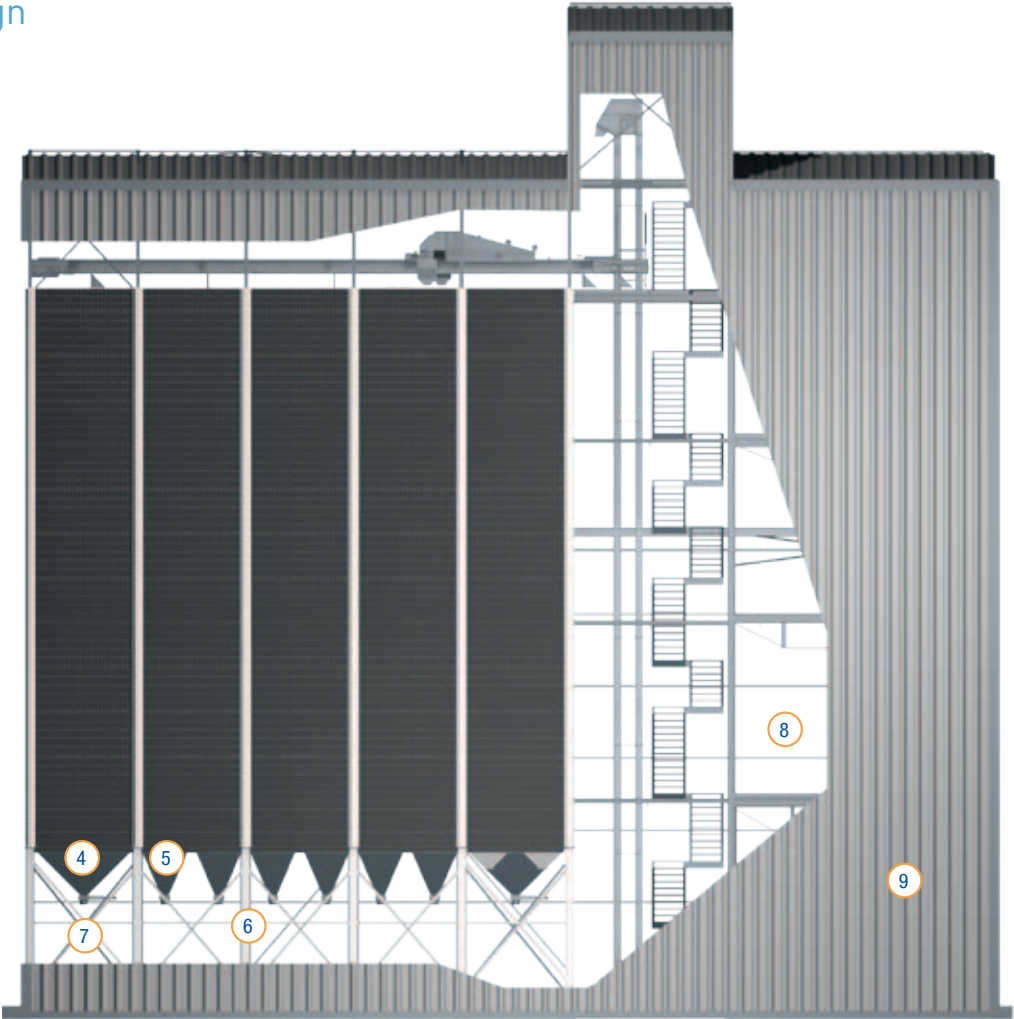
What goes in must also come out. The flow characteristics of goods to be stored have an influence on the design, the quality, the statics and the selection of the respective hopper.

Therefore, PETKUS offers a variety of hoppers in different sizes and shapes, as well as with round or square openings. To ensure an easy flow during the emptying of the silo, sufficiently large hopper openings or corresponding wall inclinations must be present. For the correct calculation of the required hopper wall inclinations to achieve an adequate mass flow and to avoid any clogging our experienced designers are ready to support you.

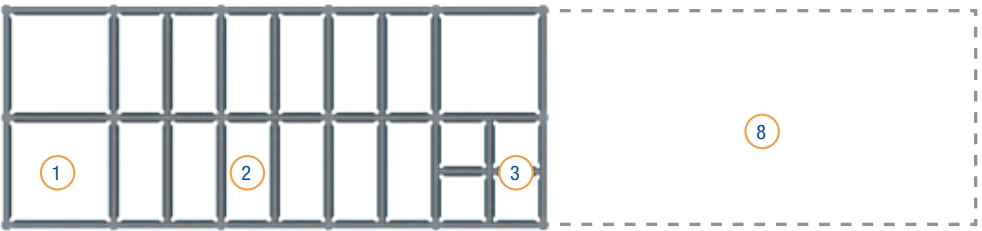


1| Smooth wall silo with machinery house under construction
2| Turn-key seed plant, Meckenheim/Germany

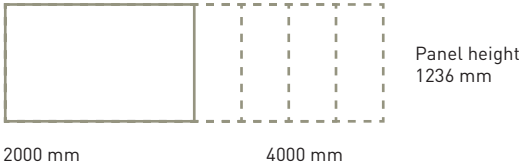
Smooth Wall Design



- 1| Single cell
- 2| 1/2 cell
- 3| 1/4 cell
- 4| Hopper
- 5| Hopper 1/2 cell
- 6| Silo base
- 7| Steel frame / Silosubstructure
- 8| Machine room
- 9| Covering



Wall elements
Upper, center, lower panel

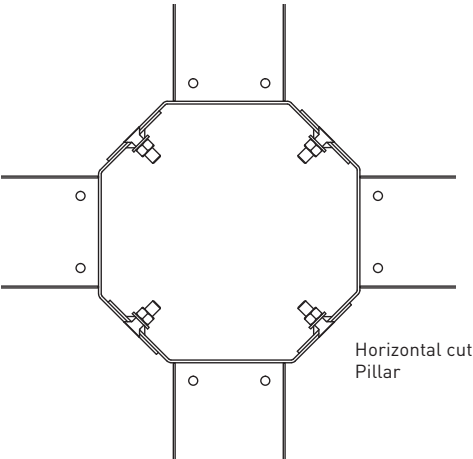


Standard equipment

- + Coated wall elements with cathaphoretic immersion priming and coated cavities
- + Double-wall elements with 2000, 2500, 3000, 3500 and 4000 mm length
- + Cell outlet hopper in segment construction bolted or welded
- + Substructure and cell ceiling
- + Trapezoidal sheet or sandwich panels for outdoor installation with cover panels

Options

- + Turn-key solution with machinery house (steel construction)
- + Stainless steel construction
- + Surface coating with paint approved for food
- + Stairways or ladders with fall back protection
- + Intermediate landings / exit platforms
- + Ventilation
- + Loading silo possible



Hopper in segment design



Hopper completely welded

PETKUS Profile Wall Silos

Perfect for easy-flowing goods

Are you looking for the perfect storage possibility for your easy-flowing bulk materials? We have the solution! As a modular system designed for limited space, PETKUS profile wall silos are ideal for the storage of various types and amounts of granular solids, pellets and other grain products. A space-saving, stable and economical silo system which offers compact, customer-oriented solutions in regards to your spatial and load requirements.

Our silos bring you an edge! PETKUS profile wall silos are rectangular, customized, secure and solid storage facilities. Our expert designers apply their know-how profitably for you, and plan the whole structure according to the current EUROCODES. The rectangular design allows an optimum use of space and can be assembled variably depending on the production process. We can construct silo cells with a wall-length up to 4 meters and a height of 20 meters without inner struts. This corresponds to a maximum volume of 320 m³. Larger cells with internal struts can be built with a capacity up to 1280 m³, with a wall length up to 4 meters and a height of up to 20 meters.

For the production of each item, PETKUS uses either hot dip galvanized or stainless steel sheets for long-lasting corrosion protection. Special finishes for the food industry are possible. In our profile wall silos we rely on our proven fitting concept, so that a quick and high-quality assembly without welding spots is possible.

Like other silo structures, assembly is done by horizontal fitting of the profile wall elements with our special countersunk screws, optionally with or without hexagon socket. A profile depth of 160 mm and an angle of 49 degrees and the countersunk screws prevent the adhesion of product residue on the walls. The static stability of cells is increased by filling of the hollow supports with concrete following installation.

Silos don't just want to be correctly filled, but also professionally emptied. Depending on the product, a hopper with wall angles of 45 or 60 degrees or a multi hopper is used as a spout. PETKUS rounds off the hopper and corners of the silos as a standard process to ensure that no blind spots exist.

Our profile wall silo can easily be integrated into existing buildings or separately set up outdoors. If the silos are outside, trapezoidal sheets or complete sandwich panels can be attached as extra protection against weather and temperature influences.



1 |

- 1 | Kengfeng / China
- 2 | Molino Grassi / Italy
- 3 | Connecting the multiple elements of the profile wall
- 4 | Hollow pillar elements



3 |

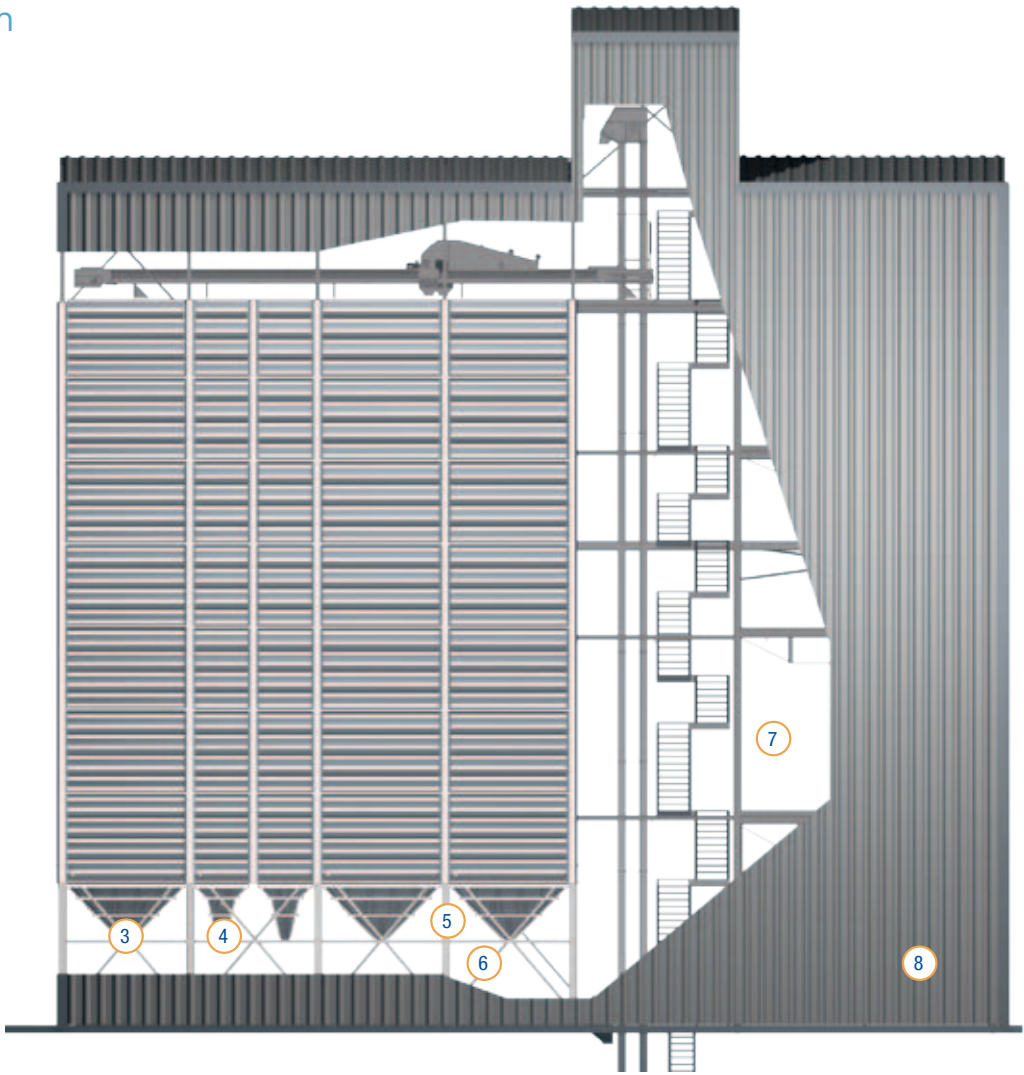


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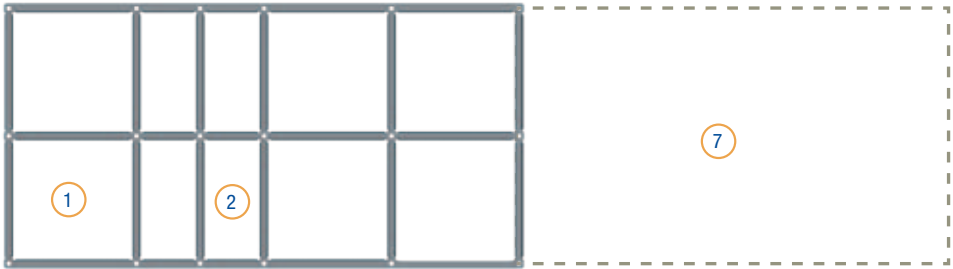


4 |

Profile Wall Design



- 1| Single cell
- 2| 1/2 cell
- 3| Hopper
- 4| Hopper 1/2 cell
- 5| Silo base
- 6| Steel frame / Silosubstructure
- 7| Machine room
- 8| Covering



Hopper 45° in segment design



Hopper 60° in segment design



Cell outlet slide

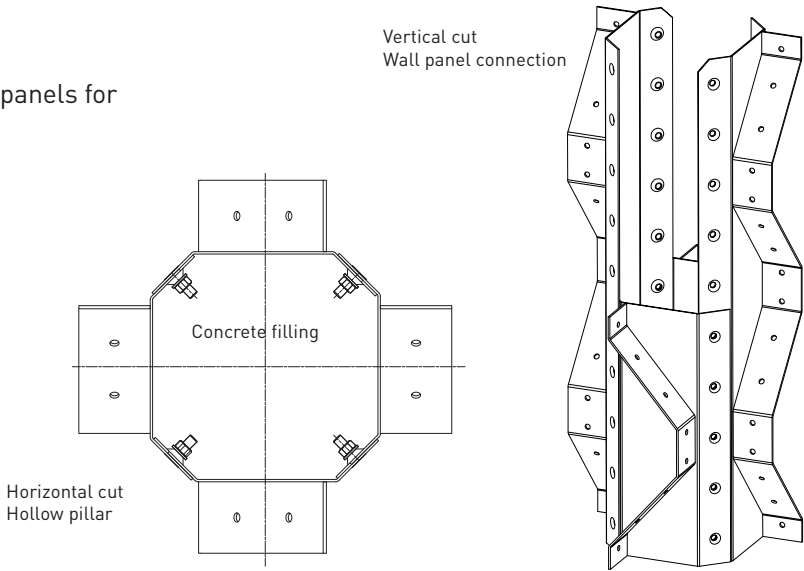
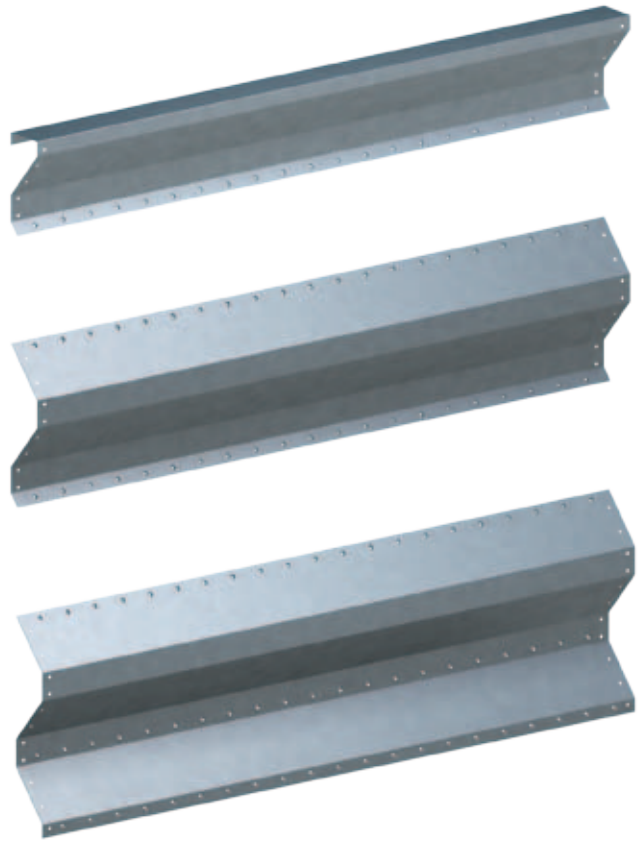


Standard equipment

- + Wall panels made of galvanized steel with 2000, 2500, 3000, 3500 and 4000 mm length
- + Corner elements welded and hot-dip galvanized
- + Cell outlet hopper in segment construction made of galvanized steel
- + Order-oriented steel substructure and cell ceiling
- + Static according to EUROCODES
- + Container transport compatible

Options

- + Turn-key solution with machinery house (steel construction)
- + DIN EN 14491:2012-10 (Dust explosion venting protective systems)
- + Stainless steel construction
- + Surface coating: with paint approved for food or industrial paint
- + Cell outlet hopper as multi hopper
- + Ventilation
- + Loading silo possible
- + Optional trapezoidal sheet or sandwich panels for outdoor installation



PETKUS Round Steel Silos

Practical for bulk goods



With regard to large storage amounts of a single type of grain or seed, where space plays a minor role and handling, flexibility and durability are the major issues, round steel silos are the product of choice. Practical for all types of cereals, oilseeds, feed pellets and industrial resins, PETKUS round silos are a simple and easy solution.

Because round steel silos are mostly outdoors and used for large amounts of a single type of grain or seed, PETKUS uses sheets with a zinc coating of 600 g/m² Z600 (according to DIN EN 10346:2015), which offers a very high corrosion protection. The individually galvanized and corrugated sheets are extremely stable and durable. Each of the connection points has been individually and additionally sealed. Thus, moisture stays out and the quality of the seed is maintained. Via the hatch the round silos are easy and quickly accessible for cleaning and maintenance. It consists of an inner opening inside hatch and protective outer hatch. The statics of PETKUS round steel silos are calculated according to the product loads of ANSI/ASAE or EUROCODE.

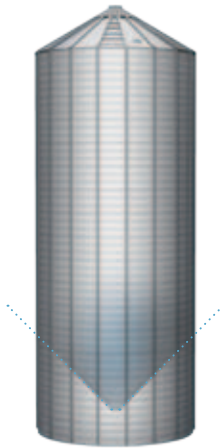
The construction is carried out in accordance with EUROCODE construction standards. The outer support pillars are made of high quality steel. The roof of the silo is a self-supporting structure made of trapezoidal segments and can be equipped with ladders, filler plugs, maintenance access, vent hole and a roof hatch.

Because every customer has different requirements for storage capacity, PETKUS offers round silo modules between 1,14 and 28,60 meters in cylindric height, diameters between 3,10 and 30,60 meters and approximately 18,000 m³ loading capacity. Hopper silos are available depending on the customer's request, with an inclination of either 45 or 60 degrees in case of less flowable bulk materials.

A wide range of accessories, such as ventilation channels, sweep augers, walkways, ladders, maintenance access, fill level indicators, temperature monitoring, cooling units and more, enable individually tailored storage systems.

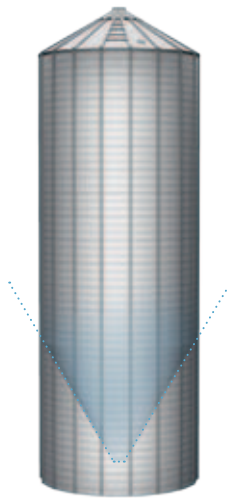
HBS45

with hip / without hip



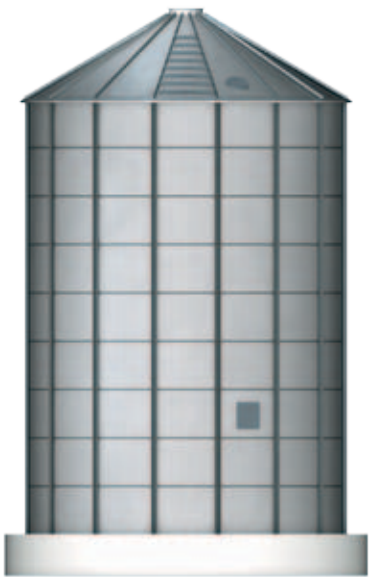
HBS60

with hip / without hip



FBS

with structural roof / without structural roof



TLS

for truck and railway



Standard equipment

- + Construction in galvanized corrugated steel sheet
- + Cylinder height of 1,14 - 28,60 m and diameters from 3,10 - 330,60 m
- + Substructure, supports and roof depending on requirements
- + Outdoor installation
- + Loading silos with diameters from 3,10 - 5,30 m

Options

- + Fill level indicator
- + Ladders
- + Ventilation
- + Temperature monitoring
- + Side emptying
- + Flat-bottom silo FBS with concrete hopper
- + Maintenance access
- + Fumigation system

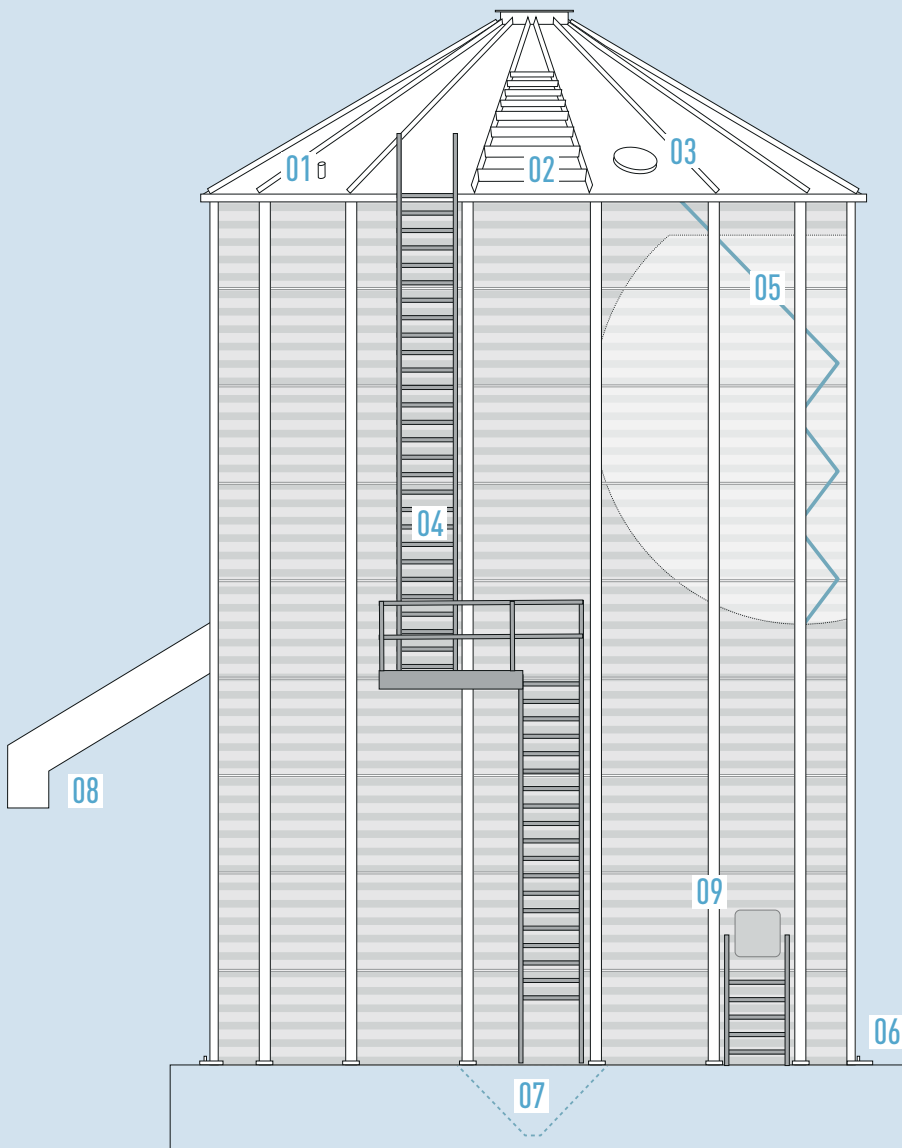


Side emptying



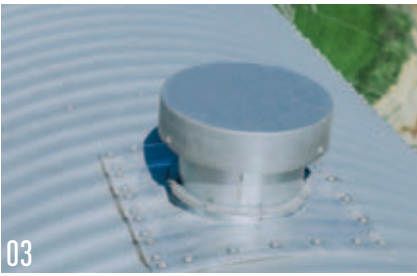
Flat-bottom silo FBS with concrete hopper

Technical Equipment



Shape is 104 mm which reduces friction and product residues

- 1| Fill level indicator max.
- 2| Roof ladder (optional with handrails)
- 3| Roof exhaust hood
- 4| Ladders with resting platforms
- 5| Grain fall speed reducer
- 6| Chemical anchor
- 7| Fill level indicator min.
- 8| Side discharge
- 9| Maintenance access



Hopper Silo HBS45



SILO Ø (m)		4,60	5,30	6,10	6,90	9,20	9,90	12,20
OUTLET Height (m)		0,80	0,80	0,80	0,80	0,80	0,80	0,80
HOPPER Height (m)		2,18	2,58	2,95	3,33	4,47	4,85	6,00
ROOF Height (m)		1,32	1,56	1,78	2,00	2,66	2,89	3,55
Σ Height* (m)		4,3	4,94	5,53	6,13	7,93	8,54	10,34
RING Numbers	CYLINDER Height (m)	CAPACITY (mt)						
4	4,58	71	97	133	176	342	406	666
5	5,72	86	116	159	208	399	472	767
6	6,86	100	135	184	240	456	538	867
7	8,01	114	154	209	273	513	604	967
8	9,15	128	173	234	305	570	670	1 068
9	10,30	143	192	259	337	627	736	1 168
10	11,44	157	211	284	369	684	802	1 268
11	12,58	171	230	309	401	741	868	1 369
12	13,73	185	249	334	433	798	934	1 469
13	14,87	200	268	359	465	855	1 000	1 569
Bulk density = 0,75 t/m³ without compressing capacity (6%) *Total height of the silo = cylinder height + Σ height / Σ height = outlet height + hopper height + roof height								

Hopper Silo HBS60



SILO Ø (m)		4,60	5,30	6,10	6,90	9,20	9,90	12,20
OUTLET Height (m)		0,80	0,80	0,80	0,80	0,80	0,80	0,80
HOPPER Height (m)		3,58	4,24	4,91	5,57	7,55	8,21	10,20
ROOF Height (m)		1,32	1,56	1,78	2,00	2,66	2,89	3,55
Σ Height* (m)		5,70	6,60	7,49	8,37	11,01	11,90	14,54
RING Numbers	CYLINDER Height (m)	CAPACITY (mt)						
4	4,58	78	108	150	200	398	476	797
5	5,72	93	127	175	232	455	542	897
6	6,86	107	146	200	264	512	608	998
7	8,01	121	165	225	296	569	674	1098
8	9,15	135	184	250	328	626	740	1198
9	10,30	150	203	275	360	683	806	1298
10	11,44	164	222	300	392	740	872	1399
11	12,58	178	241	325	425	797	938	1499
12	13,73	192	260	350	457	854	1004	1599
13	14,87	207	279	375	489	911	1070	1700
Bulk density = 0,75 t/m³ without compressing capacity (6%) *Total height of the silo = cylinder height + Σ height / Σ height = outlet height + hopper height + roof height								

Flat Bottom Silo FBS



SILO Ø (m)		9,20	10,70	12,20	14,50	15,30	16,80	18,30	19,90	21,40	22,90	26,00	30,60
ROOF Height (m)		2,66	3,10	3,55	3,68	3,99	4,43	4,87	5,31	5,74	6,18	7,07	8,39
RING Numbers	CYLINDER Height (m)	CAPACITY (mt)											
7	8,01	437	599	789	1 138	1 276	1 558	1 873	2 245	2 630	3 049	4 030	5 789
8	9,15	494	676	889	1 279	1 433	1 749	2 099	2 512	2 938	3 402	4 486	6 420
9	10,30	551	753	990	1 421	1 591	1 939	2 325	2 779	3 247	3 755	4 941	7 051
10	11,44	608	830	1 090	1 563	1 749	2 129	2 550	3 046	3 555	4 109	5 397	7 682
11	12,58	665	907	1 190	1 704	1 907	2 319	2 776	3 313	3 864	4 462	5 853	8 313
12	13,73	722	984	1 291	1 846	2 064	2 509	3 002	3 580	4 173	4 816	6 308	8 944
13	14,87	779	1 062	1 391	1 988	2 222	2 700	3 227	3 847	4 481	5 169	6 764	9 575
14	16,02	836	1 139	1 491	2 130	2 380	2 890	3 453	4 113	4 790	5 522	7 219	10 206
15	17,16	893	1 216	1 591	2 271	2 538	3 080	3 679	4 380	5 098	5 876	7 675	10 837
16	18,30	950	1 293	1 692	2 413	2 695	3 270	3 904	4 647	5 407	6 229	8 130	11 468
17	19,45	1 007	1 307	1 792	2 555	2 853	3 460	4 103	4 914	5 716	6 583	8 586	12 099
18	20,59	1 064	1 447	1 892	2 696	3 011	3 651	4 356	5 181	6 024	6 936	9 041	12 730
19	21,74	1 121	1 525	1 993	2 838	3 169	3 841	4 581	5 448	6 333	7 289	9 497	13 361

Bulk density = 0,75 t/m³ without compressing capacity (6%) *Total height of the silo = roof height + cylinder height

Round Buffer Silo TLS



TLS45

SILO Ø (m)	3,10	3,60	3,80	4,60	5,30
OUTLET Height (m)	0,80	0,80	0,80	0,80	0,80
HOPPER Height (m)	1,41	1,67	1,80	2,18	2,58
ROOF Height (m)	0,82	0,97	1,04	2,18	1,56
Σ Height* (m)	3,03	3,44	3,64	4,30	4,94

RING Numbers	CYLINDER Height (m)	CAPACITY (mt)				
3	3,43	24	33	37	57	79
4	4,58	30	42	47	71	97
5	5,72	37	50	57	86	116
6	6,86	43	59	66	100	135
7	8,01	50	68	76	114	154
8	9,15	56	77	86	128	173
9	10,30	63	85	96	143	192

Bulk density = 0,75 t/m³ without compressing capacity (6%) *Total height of the silo = cylinder height + Σ height / Σ height = outlet height + hopper height + roof height

PETKUS Silo Equipment

Professional storage helpers

Standard technology forms the basic components of every silo system and subsequent seed plant. But in order to meet actual needs and customized requirements, special tools, additional equipment and options must be put together. PETKUS takes the customers' needs into account and offers tailor-made solutions.

We can offer advice on what additional equipment makes sense for respective storage technology. Our company has many years of experience and international expertise in this area. A silo plant only runs smoothly when the storage technology can meet its needs.

Without adequate and proper cooling and ventilation, humidity and heat can get into the grain being stored. To maintain product quality, proper cooling is needed. Purity, moisture and temperature in the silo are the decisive parameters which can accelerate the metabolic processes of the grain meaning the development of carbon dioxide, heat, condensation and the proliferation of microorganisms. The PETKUS aeration system meets all the requirements to achieve optimum storage.

Half full or half empty? The specification of a silo cell load level is essential for the economic efficiency of a silo plant. Our filling level sensor warning device has a modern and reliable technology that allows an accurate level monitoring or display. With an uncomplicated connection to a parent control, optimal placement and the corresponding number of sensors, the device does its work in a professional and reliable manner.

Walkways serve as a safe helper for monitoring and as a bridge to the individual cells. They are equipped with railings and manufactured in a bolted, framework construction. The modular system using galvanized steel allows for a high variability and bridges in any length.

An uncomplicated and effective silo emptying eases the everyday life in a silo plant. No matter whether it is granular or free-flowing bulk materials such as cereals, oilseeds or similar agricultural products – a PETKUS sweep auger removes everything. The auger is suitable for each flat bottom silo size due to their modular design.

Sweep Auger

Standard equipment

- + Welded version with colouring
- + Drive unit with gear motor
- + Motors in accordance with ATEX Directive
- + One drive wheel plus support wheel from 10 m length

Options

- + Equipped with position sensors

		FS20	FS26
Length	(mm)	depending on the model	
Drive wheel ø	(mm)	300	300
Engine Power	(kW)	4,0 - 4,2	5,5 - 18,5
Conveying screw			
Diameter	(mm)	200	260
Speed (RPM)	(U/min')	205	260
Flow rate*	(t/h)	until 40	until 100

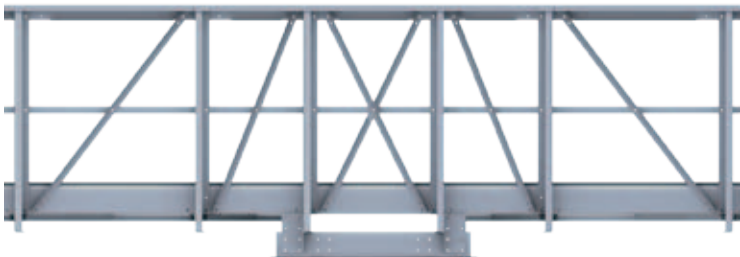
*based on 0,75 t/m³



Walkway

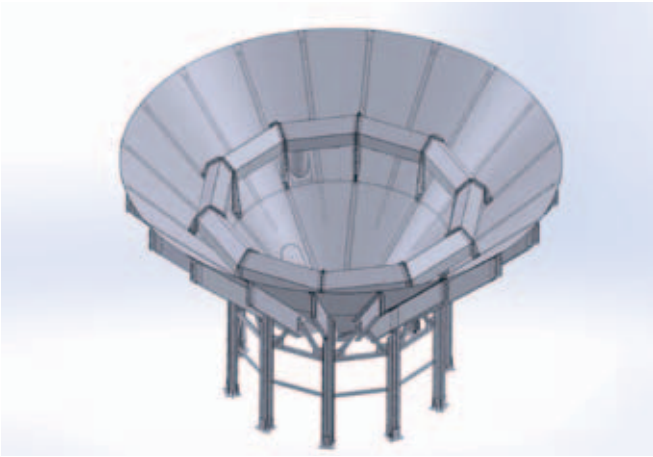
Standard equipment

- + Construction in galvanized sheet steel
- + Modular design
- + Screw-down version
- + Framework construction
- + Specifications according to DIN 1055
- + Available width 0,60 - 3,0 m



Ventilation

Ventilation Ring Hopper Silo



The ventilation ring allows ambient or cooled air to enter the silo, preventing uncontrolled heating or spoilage of the stored product. It ensures good and uniform ventilation of the silo without hindering the discharge from the hopper silo.

Ventilation Channels Flat Bottom Silos



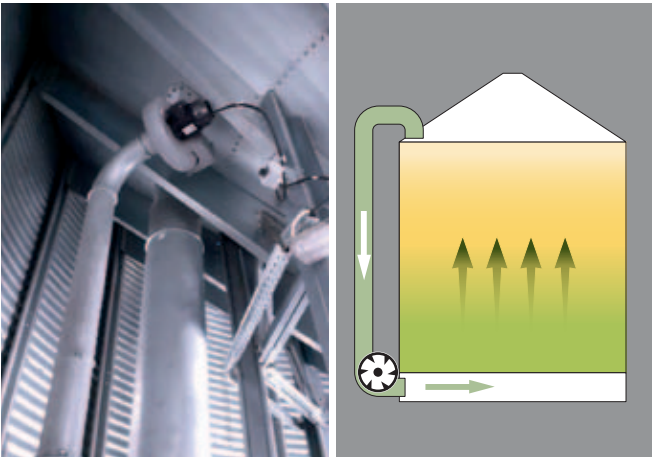
The ventilation channels are integrated into the foundation and allow ambient or cooled air to be introduced into the silo. This form of ventilation also prevents uncontrolled heating or spoilage of the stored product. Usually 15% of the floor area of a flat-bottom silo is covered with ventilation channels to ensure an even distribution of air in the silo.

Roof Ventilation



Roof ventilators minimise the condensation inside the silo roof. Especially when warm product from a dryer is being stored, the additional use of a roof ventilator is recommended. If ventilation channels or a ventilation ring are used at the same time, ventilation is significantly improved.

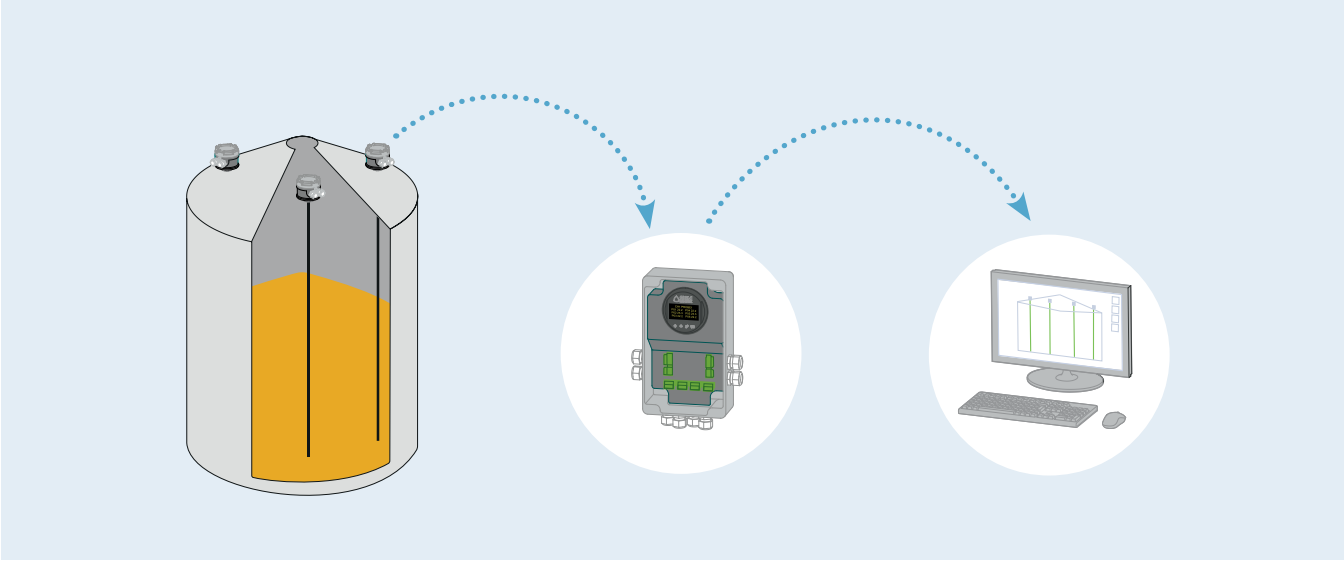
Fumigation



A fumigation system is designed to constantly recirculate a small volume of air for the even distribution of gaseous insecticides in the stored goods. It consists of a specially sealed roof, a pipe and a fan.

Temperature Monitoring

Simple Temperature Monitoring (temperature only)



Advanced Temperature Monitoring



Temperature monitoring



Temperature & moisture probe



Anti-condensation probe



Weather station



Relay module



Mobile devices

PETKUS Buffer Silos

For storing almost anything for a short time



Buffer with tension bracing for waste and grain

Buffer without tension bracing with 'Bomb door' discharge

PETKUS buffer silos are incredibly practical in every-day use with granular and free-flowing products. Short-term or temporary storage buffer, mixing, loading and dosing of products - everything is possible! Buffer silos are optimal as loading cells and can be designed according to shipping needs, whether for truck or railway loading.

Our buffer silos are square, galvanized steel silos in modular construction, which offer an extremely flexible usage range as well as customized dimensions. All buffer silos consist of completely screwed ring elements with a variable side length of 1000 to 3000 mm. A PETKUS standard is galvanizing to protect against corrosion. They meet the same structural requirements in accordance with ANSI/ASAE and EUROCODE as our entire storage technology. A customized substructure and supports made of high-grade steel complete the buffer silos. The supports for the outlet hoppers with either 45 or 60 degrees are designed according to the required emptying height. This allows for the possibility of driving underneath for loading.

Standard equipment

- + Construction in galvanized steel sheet
- + Ring elements with a side length of 2000, 2500 or 3000 mm
- + Outlet hopper with adjustable height
- + Substructure and supports

Options

- + Construction in stainless steel
- + Accessible roof with hatch and flanged rim inlet
- + Fill level sensor warning device
- + Cell outlet slide
- + 'Bomb door' discharge for less flowable products
- + Auger discharge for less flowable products
- + Access ladder

Buffer Silo for Truck Loading



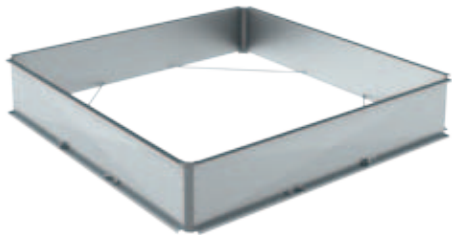
Panel height 600 mm

2000 mm

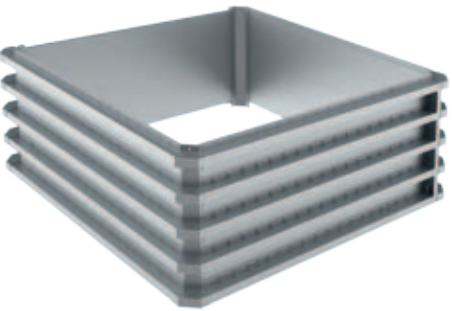
2500 mm

3000 mm

Buffer Silo for Railway Loading



with tensioning



without tensioning
(suitable for seed)

Panel size (m)		2 x 2	2,5 x 2,5	3 x 3
No. of rings	Height (m)	Load capacity (m³)		
10	6 000	24,00	37,50	54,00
9	5 400	21,60	33,75	48,60
8	4 800	19,20	30,00	43,20
7	4 200	16,80	26,25	37,80
6	3 600	14,40	22,50	32,40
5	3 000	12,00	18,75	27,00
4	2 400	9,60	15,00	21,60
3	1 800	7,20	11,25	16,20



PETKUS

 **Strong Seed. Healthy Grain.**

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